LANTHANIDE OXIDE / HAFNIUM OXIDE DIELECTRIC LAYERS

ABSTRACT

Dielectric layers containing an atomic layer deposited hafnium oxide and an electron beam evaporated lanthanide oxide and a method of fabricating such a dielectric layer produce a reliable dielectric layer having an equivalent oxide thickness thinner than attainable using SiO_2. Forming a layer of hafnium oxide by atomic layer deposition and forming a layer of a lanthanide oxide by electron beam evaporation, where the layer of hafnium oxide is adjacent and in contact with the layer of lanthanide, provides a dielectric layer with a relatively high dielectric constant as compared with silicon oxide. The dielectric can be formed as a nanolaminate of hafnium oxide and a lanthanide oxide.